

Applicant : Mathur, et al.
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Amendment to the Claims:

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Please amend the claims as follows:

Please cancel claims 22 to 30, without prejudice.

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An isolated or recombinant polynucleotide selected from the group consisting of:

- (a) a polynucleotide encoding a thermostable phosphatase comprising an amino acid sequence as set forth in SEQ ID NO: 28; and
- (b) a polynucleotide which is complementary to the polynucleotide of (a).

Claim 2 (currently amended): An isolated or recombinant polynucleotide selected from the group consisting of:

- (a) SEQ ID NO: 19; and (b) SEQ ID NO: 19, where T can also be U; wherein the polynucleotide of (a) and (b) encode a phosphatase.

Claim 3 (currently amended): The isolated or recombinant polynucleotide of claims 1, 2, 5, 13, or 14, wherein the polynucleotide [[is]] comprises DNA.

Claim 4 (currently amended): The isolated or recombinant polynucleotide of claims 1, 2, 5, 13, or 14, wherein the polynucleotide [[is]] comprises RNA.

Claim 5 (currently amended): An or recombinant isolated polynucleotide selected from the group consisting of:

- (a) a polynucleotide having phosphatase activity and having at least 70% sequence identity to a polynucleotide encoding an enzyme having phosphatase activity contained in ATCC Deposit No. 97379, or enzymatically active fragments thereof, wherein said enzyme is obtained from *Ammonifex degenesii* KC4; and
- (b) a polynucleotide complementary to the polynucleotide of (a).

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Claim 6 (currently amended): A vector comprising the polynucleotide of claim 5
or the DNA of claim 3.

Claim 7 (previously presented): A host cell comprising the vector of claim 6.

Claim 8 (currently amended): A process for producing a polypeptide comprising:
expressing from the host cell of claim 7 a polypeptide encoded by the polynucleotide or said
DNA and isolating the polypeptide.

Claim 9 (currently amended): A process for producing a recombinant cell
comprising: transforming or transfecting a cell with the vector of claim 6 such that the cell
expresses the polypeptide encoded by the polynucleotide or the DNA contained in the vector.

Claim 10 (currently amended): An isolated or recombinant [[A thermostable]]
phosphatase of which at least a portion is encoded by a polynucleotide of claim 14 and wherein
the [[thermostable]] phosphatase comprises an amino acid sequence which [[is]] has at least 70%
sequence identity [[identical]] to the amino acid sequence as set forth in SEQ ID NO: 28.

Claim 11 (currently amended): An isolated or recombinant [[A]] phosphatase
enzyme of which at least a portion is encoded by a polynucleotide of claim [[14]] 5 and wherein
the phosphatase comprises an amino acid sequence which [[is]] has at least 70% sequence
identity [[identical]] to the amino acid sequence as set forth in SEQ ID NO: 28.

Claim 12 (Canceled)

Claim 13 (currently amended): An isolated or recombinant polynucleotide
selected from the group consisting of:

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- (a) a polynucleotide encoding a polypeptide having phosphatase activity and having at least ~~[[70%]]~~ 90% sequence identity to a polynucleotide that encodes the polypeptide sequence of SEQ ID NO:28, or enzymatically active fragments thereof; and
- (b) a polynucleotide complementary to (a).

Claim 14 (currently amended): An isolated or recombinant polynucleotide selected from the group consisting of:

- (a) a polynucleotide that encodes a polypeptide having at least 70% sequence identity to SEQ ID NO:28 or enzymatically active fragments thereof, wherein the polypeptide has phosphatase activity; and
- (b) a polynucleotide complementary to (a).

Claim 15 (currently amended): An isolated or recombinant ~~[[A]]~~ polynucleotide ~~[[fragment]]~~ having a length of at least 15 nucleotides, wherein the nucleotides are contiguous bases of the polynucleotide of claim 1 and the polynucleotide hybridizes with specificity to a polynucleotide that encodes a ~~[[polypeptide having activity as a]]~~ phosphatase or hybridizes with specificity to its ~~[[complement]]~~ complementary sequence, or hybridizes with specificity to a nucleic acid encoding an enzymatically active fragment of the phosphatase, under hybridization conditions comprising 0.9 M NaCl, 50 mM NaH₂PO₄, and 0.5% SDS at 45°C.

Claim 16 (currently amended): An isolated or recombinant ~~[[A]]~~ polynucleotide ~~[[fragment]]~~ having a length of at least 15 nucleotides, wherein the nucleotides are contiguous bases of the polynucleotide of claim ~~[[2 or]]~~ 14 and hybridizes with specificity to its ~~[[complement]]~~ complementary sequence, and the polynucleotide hybridizes with specificity to a polynucleotide that encodes a phosphatase, or hybridizes with specificity to a nucleic acid encoding an enzymatically active fragment of the phosphatase, or its complement, under hybridization conditions comprising 0.9M NaCl, 50 mM NaH₂PO₄, and 0.5% SDS at 45°C.

Claim 17 (currently amended): An isolated or recombinant ~~[[A]]~~ polynucleotide ~~[[fragment]]~~ having a length of at least 15 nucleotides, wherein the nucleotides are contiguous

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bases of the polynucleotide of claim 5 and the polynucleotide hybridizes with specificity to a polynucleotide that encodes a polypeptide that has phosphatase activity or hybridizes with specificity to its [[complement]] complementary sequence, under hybridization conditions comprising 0.9M NaCl, 50 mM NaH₂PO₄, and 0.5% SDS at 45°C.

Claim 18 (currently amended): An enzymatically active fragment of the [[thermostable]] phosphatase of claim 10, wherein the fragment comprises at least 30 contiguous amino acid residues and has phosphatase activity.

Claim 19 (previously presented): An enzymatically active fragment of the phosphatase enzyme of claim 11, wherein the fragment comprises at least 30 contiguous amino acid residues and has phosphatase activity.

Claim 20 (currently amended): An isolated or recombinant [[A]] polynucleotide [[fragment]] having a length of at least 15 nucleotides, wherein the nucleotides are contiguous bases of the polynucleotide of claim 13 and [[hybridizes]] hybridize with specificity to a polynucleotide that encodes a polypeptide that has phosphatase activity or hybridize with specificity to its [[complement]] complementary sequence, under hybridization conditions comprising 0.9M NaCl, 50 mM NaH₂PO₄, and 0.5% SDS at 45°C and a wash under conditions comprising 30 minutes at room temperature in 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na₂EDTA, 0.5% SDS.

Claim 21 (currently amended): An isolated or recombinant [[A]] polynucleotide [[fragment]] having a length of at least 15 nucleotides, wherein the nucleotides are contiguous bases of the polynucleotide of claim 14 and [[hybridizes]] hybridize with specificity to a polynucleotide that encodes a polypeptide that has phosphatase activity or hybridize with specificity to its [[complement]] complementary sequence, under hybridization conditions comprising 0.9M NaCl, 50 mM NaH₂PO₄, and 0.5% SDS at 45°C.

Claims 22 to 28 (canceled)

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Claim 31 (new): The isolated or recombinant polynucleotide of claim 14 comprising a polynucleotide that encodes a polypeptide having at least 95% sequence identity to SEQ ID NO:28 or enzymatically active fragments thereof.

Claim 32 (new): The isolated or recombinant polynucleotide of claim 31 comprising a polynucleotide that encodes a polypeptide having at least 97% sequence identity to SEQ ID NO:28 or enzymatically active fragments thereof.

Claim 33 (new): The isolated or recombinant phosphatase of claim 10, wherein the phosphatase comprises an amino acid sequence which has at least 80% sequence identity to the amino acid sequence as set forth in SEQ ID NO: 28.

Claim 34 (new): The isolated or recombinant phosphatase of claim 33, wherein the phosphatase comprises an amino acid sequence which has at least 90% sequence identity to the amino acid sequence as set forth in SEQ ID NO: 28.

Claim 35 (new): The isolated or recombinant phosphatase of claim 34, wherein the phosphatase comprises an amino acid sequence which has at least 95% sequence identity to the amino acid sequence as set forth in SEQ ID NO: 28.

Claim 36 (new): The isolated or recombinant phosphatase of claim 35, wherein the phosphatase comprises an amino acid sequence which has at least 97% sequence identity to the amino acid sequence as set forth in SEQ ID NO: 28.

Claim 37 (new): The isolated or recombinant phosphatase of claim 10, wherein the phosphatase activity is an alkaline phosphatase activity.

Claim 38 (new): The isolated or recombinant polynucleotide of claim 14, wherein the phosphatase activity is an alkaline phosphatase activity.

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Claim 39 (new): The isolated or recombinant polynucleotide of claim 14, wherein the phosphatase activity is a phosphodiesterase activity.

Claim 40 (new): A method for dephosphorylating a phosphorylated nucleic acid comprising contacting the isolated or recombinant phosphatase of claim 10 with the phosphorylated nucleic acid.

Claim 41 (new): The isolated or recombinant polynucleotide of claim 15 having a length of at least 30 nucleotides.

Claim 42 (new): The isolated or recombinant polynucleotide of claim 41 having a length of at least 50 nucleotides.

Claim 43 (new): The isolated or recombinant polynucleotide of claim 42 having a length of at least 150 nucleotides.

Claim 44 (new): The isolated or recombinant polynucleotide of claim 14, wherein the polynucleotide comprises a sequence encoding an amino acid sequence having at least 80% sequence identity to the amino acid sequence as set forth in SEQ ID NO: 28.